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Abstract

We consider uncertainty in payoffs in peer group situations. By using the cooperative interval games approach, we introduce interval peer group situations and for the related interval peer group games we give properties of monotonicity, convexity and specify the Shapley value and the Weber set. Applications to sequential production situations and auctions are studied.

Abstract

We consider equilibrium in multiuser multipath routing optimization problem in Wardrop model where selfish players distribute their TCP traffic in the shared multipath network. Minimization of the end-to-end traffic delay over all paths for each user is the criterion of optimality. We discover that in the game with latency function $f_e(\delta) = 1 - e^{-\alpha_e \delta}$ approximating the TCP congestion control over the paths, the price of anarchy is bounded, leading to the conclusion that non-cooperative selfish users can safely coexist in the multipath network and successfully achieve a good performance if each adheres to the equilibrium flow splitting strategy.

Abstract

Life insurance companies are more and more interested in creating flexible policies in order to reach more specific segments of the market than in the past. They can induce the agents to sell a personalized policy to a specific class of clients selecting for them an appropriate reward; in this case we have an optimization problem connected to the reward of the agent. In this paper, the Leader-Follower game is proposed as a model to study the hierarchical relationship between the company and the agent and it is applied to a particular case of unit-linked policy.

Abstract

In this paper we investigate a search resource allocation game with incomplete information. The Baeysian equilibrium is found in closed form and its uniqueness is proved. Some properties of equilibrium as function on total search resources are exploded.

Abstract

The problem of quantitative estimation of quality and the development of quality choice mechanism in case of competition are considered. Quality choice is an action that is based on changing of quantitative quality estimation. The main theoretical goal of the research is to develop a quality choice mechanism which is based on construction and solution of the appropriate game-theoretical model of competition taking into account the information on consumers preferences. The suggested mechanism of quality choice under competition and vertical differentiation can be used for suggestion some strategic recommendations to companies to plan an effective production system which is demanded on the market. The paper also presents the results of empirical research which is an example of application of the suggested game-theoretical model of competition and vertical differentiation for the market of Internet-trading systems, which are used for exchange auction.

Abstract

Effectivity functions are formalized descriptions of the power structure in a society; it assigns to each coalition of individuals a family of subsets of the set of all outcomes in society. These sets may be interpreted as restrictions on society's choice of outcome caused by the joint activities of the coalition. The concept of an effectivity function has found several applications in game theory and social choice.

In the present work, we give a brief introduction to effectivity functions and their use, and we outline the classical results on core stability. After this, we discuss another solution concept, the bargaining set introduced by Aumann and Maschler, in the context of effectivity functions, presenting different ways of generalizing the notions of objection and counterobjection to this context.

An effectivity function is bargaining set stable if the bargaining set is nonempty for every assignment of preferences over outcomes to individuals. It turns out that bargaining set stability, which is a property related to than core stability, cannot be fully characterized by the standard tools of stability analysis. As a consequence, we shift attention to a slightly weaker form of stability, where a characterization is possible in terms of cyclical properties of the effectivity function.

Abstract

We define a subset of the reasonable set by using shifted games and then characterize it. We examine whether various solutions are included in this subset or not.

Abstract

A game-theoretic emission reduction model is studied. The process is modeled as cooperative differential game. The stable mechanism of distribution of the common cooperative costs among players is proposed. The perfect Nash equilibrium is found. We design a stable Shapley value as a cooperative solution, which is time-consistent. The Shapley value is also strategic stable and satisfies the irrational-behavior-proofness condition. The coalitional solution in the form of PMS-vektor is constructed.

Abstract

The purpose of this paper is to develop a consistent theory of formal schemes of solution concepts for non-cooperative games using some universal properties of equilibrium. It is well known that despite of empirical analysis of numerous different ideas of optimality, for a moment there is no general theory or even definition of the "formal side" of corresponding solution concepts. We propose a general axiomatic definition of formal scheme of solution concept for the most general class of non-cooperative games using a natural categorial structure on it. To be more accurate, we introduce a categorial structure on this class of games and then, using as conceptual justification the fact that naturally generalized equilibrium is a functor from this category, formally define an *optimality principle* as a suitable functor from this category of games to the category of sets. Further we introduce in this way a number of equilibrium-like optimality principles and study some of their properties and relations.

Abstract

We study the problem of sequential prediction of categorical data and discuss a generalisation of Blackwell's algorithm on 0-1 data. The arguments are based on Blackwell's approachability results given in Blackwell, D. (1956). They use mainly linear algebra.

Abstract

We deal with n-person normal form game where a subset of players decide to cooperate (signatories) and choose strategies by maximizing the aggregate welfare of the coalition members. The non-cooperating (non-signatories) players choose their strategies as a Nash equilibrium. In this paper the Stackelberg assumption is considered for the partial cooperative equilibrium concept and the model is presented also in the case of non-signatories multiple decision. The class of symmetric aggregative games is considered and applications to public goods games and global emission games are illustrated.

Abstract

This paper investigates the existence of strong Berge equilibrium which is also Pareto efficient (SBPE) and strong Nash equilibrium in continuous and convex games. We present the main properties of SBPE and strong Nash equilibrium (SNE), and we prove that any SBPE is also a SNE. We show that with the compactness of strategy spaces, the concavity of payoff functions and a certain condition, the existence of SBPE is guaranteed. Finally, we suggest a method for computing this equilibrium. Our equilibrium existence result neither implies nor is implied by the existing results in the literature such as in Ichiishi [1981].

Abstract

A technique to determine closed-loop Nash equilibria of n-player differential games is developed when their dynamic state-control system is composed of decoupled ODEs. In particular, the theory of Lie point symmetries is exploited to achieve first integrals of such systems.

Abstract

The class of differential games with random duration is studied in the paper. The problem of the feedback Nash equlibrium calculation is examined. As a result, the Hamilton-Jacobi-Bellman equation for the problem with random duration is derived. The results are illustrated with an example.

Abstract

A comprehensive characterization of time-consistent agreeable solution in differential games has been provided by Petrosyan (1997). This article presents a notational note to the analysis so that readers acquainted with value functions in control and optimization would find it more familiar.

Abstract

In this paper three conceptions of strong equilibrium are investigated. It is shown that two of them are subsets of one, which is more general. The dependence between definitions is shown on a finite game of two players. These definitions and their properties are specially investigated in differential games. A special technique based on a scalarization of vector criteria is used to construct strong equilibrium. The main results of the paper are sufficient conditions for strong equilibrium existence. This approach is implemented in an example of differential game with three players.